

IN THE CLAIMS:

The following is a listing of all the claims as they currently stand. Claims 1, 8, 11, and 12 are amended. Claims 6, 10, and 14-42 are canceled. Claims 43-71 are added.

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1. (Amended) An optical train for viewing an object, the optical train comprising:

an objective lens system for capturing an image of the object;

an ocular lens system that forms a final image of the object;

a relay lens system disposed along an optical path between the objective lens system and the ocular lens system;

wherein an intermediate image is formed within an optical element in **[at least one of]** the objective lens system, [ocular lens system, and relay lens system];

wherein the relay lens system is separated from the objective lens system by an objective-relay gap, wherein the optical element is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the objective-relay gap.

2. (As filed) The optical train of claim 1 wherein the optical element has an index of refraction greater than one.

3. (As filed) The optical train of claim 1 wherein the intermediate image formed within the optical element is expanding.

4. (As filed) The optical train of claim 1 wherein the optical element comprises a single lens, a rod lens, a compound lens, an extended lens, or a glass element.

5. (As filed) The optical train of claim 1 wherein the optical element comprises a glass element coupled to a lens, wherein the intermediate image is formed in the glass element.

6. (Canceled).

7. (As filed) The optical train of claim 1, wherein the ocular lens system comprises the optical element, wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the optical element is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

8. (Amended) An endoscope comprising:

a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;

an ocular lens system disposed along the proximal portion;

a relay lens system disposed along the shaft between the proximal portion and the distal portion;

an objective lens system disposed along the distal portion, the objective lens system comprising a lens, the objective lens forming a first intermediate image within the lens;

wherein the ocular lens system comprises a second lens, wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the second lens is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

9. (As filed) The endoscope of claim 8, wherein the relay lens system is separated from the objective lens system by an objective-relay gap, wherein the lens is disposed

adjacent the relay lens system, and wherein no intermediate image is disposed within the objective-relay gap.

10. (Canceled)

11. (Amended) The endoscope of claim 8, wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein a relay gap is disposed between each pair of adjacent relay units so that an associated relay intermediate image is formed therein.

12. (Amended) The endoscope of claim 8 wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein an optical element is disposed between each pair of adjacent relay units so that an intermediate image is formed in the optical element.

13. (As filed) The endoscope of claim 12 wherein the optical element has a refractive index greater than one.

*Claims 14-42 were previously canceled*

43. (Added) An optical train for viewing an object, the optical train comprising:

an objective lens system for capturing an image of the object;

an ocular lens system that forms a final image of the object;

a relay lens system disposed along an optical path between the objective lens system and the ocular lens system;

wherein an intermediate image is formed within an optical element in the ocular lens system,

wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the optical element is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

44. (Added) The optical train of claim 43 wherein the optical element has an index of refraction greater than one.

45. (Added) The optical train of claim 43 wherein the intermediate image formed within the optical element is expanding.

46. (Added) The optical train of claim 43 wherein the optical element comprises a single lens, a rod lens, a compound lens, an extended lens, or a glass element.

47. (Added) The optical train of claim 43 wherein the optical element comprises a glass element coupled to a lens, wherein the intermediate image is formed in the glass element.

48. (Added) The optical train of claim 43 wherein the relay lens system is separated from the objective lens system by an objective-relay gap, and wherein no intermediate image is disposed within the objective-relay gap.

49. (Added) An endoscope comprising:

a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;

an ocular lens system disposed along the proximal portion;

a relay lens system disposed along the shaft between the proximal portion and the distal portion;

an objective lens system disposed along the distal portion, the objective lens system comprising a lens, the objective lens forming a first intermediate image within the lens;

wherein the relay lens system is separated from the objective lens system by an objective-relay gap, wherein the lens is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the objective-relay gap.

50. (Added) The endoscope of claim 49, wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein a relay gap is disposed between each pair of adjacent relay units so that an associated relay intermediate image is formed therein.

51. (Added) The endoscope of claim 49 wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein an optical element is disposed between each pair of adjacent relay units so that an intermediate image is formed in the optical element.

52. (Added) The endoscope of claim 51 wherein the optical element has a refractive index greater than one.

53. (Added) The endoscope of claim 49 wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the second lens is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

54. (Added) An endoscope comprising:  
a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;  
an ocular lens system disposed along the proximal portion;  
a relay lens system disposed along the shaft between the proximal portion and the distal portion;  
an objective lens system disposed along the distal portion, the objective lens system comprising a lens, the objective lens forming a first intermediate image within the lens;  
wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein a relay gap is disposed between each pair of adjacent relay units so that an associated relay intermediate image is formed therein.

55.  
56. (Added) The endoscope of claim 54 wherein the ocular lens system comprises a second lens, wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the second lens is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

56.  
57. (Added) The endoscope of claim 54 wherein the relay lens system is separated from the objective lens system by an objective-relay gap, wherein the lens is disposed

adjacent the relay lens system, and wherein no intermediate image is disposed within the objective-relay gap.

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(Added)

An endoscope comprising:

a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;

an ocular lens system disposed along the proximal portion;

a relay lens system disposed along the shaft between the proximal portion and the distal portion;

an objective lens system disposed along the distal portion, the objective lens system comprising a lens, the objective lens forming a first intermediate image within the lens;

wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein an optical element is disposed between each pair of adjacent relay units so that an intermediate image is formed in the optical element.

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(Added)

The endoscope of claim <sup>57</sup>~~58~~ wherein the optical element has a refractive index greater than one.

59/60

(Added)

The endoscope of claim <sup>57</sup>~~58~~ wherein the ocular lens system comprises a second lens, wherein the relay lens system is separated from the ocular lens system by an ocular-relay gap, wherein the second lens is disposed adjacent the relay lens system, and wherein no intermediate image is disposed within the ocular-relay gap.

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(Added)

The endoscope of claim <sup>57</sup>~~58~~ wherein the relay lens system is separated from the objective lens system by an objective-relay gap, wherein the lens is disposed

adjacent the relay lens system, and wherein no intermediate image is disposed within the objective-relay gap.

~~61~~  
62.

(Added) An endoscope comprising:

a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;

an objective lens system disposed along the distal portion;

an ocular lens system disposed along the proximal portion, the ocular lens system comprising a lens;

Al  
cont.  
a relay lens system disposed along the shaft between the objective lens system and the ocular lens system, wherein the relay lens system is separated from the objective lens system by an objective-relay gap and the relay lens system is separated from the ocular lens system by an ocular-relay gap,

wherein intermediate image(s) are formed in at least one of the objective lens system, ocular lens system and relay lens system, and wherein no intermediate image is formed in the objective-relay gap and the ocular-relay gap.

~~62~~  
63.

(Added) The endoscope of claim ~~62~~<sup>61</sup> wherein the intermediate images are formed separately in the objective lens system, the ocular system and the relay lens system.

~~63~~  
64.

(Added) The endoscope of claim ~~62~~<sup>61</sup> wherein the intermediate image is formed in the ocular system.

~~64~~  
65.

(Added) The endoscope of claim ~~62~~<sup>61</sup>, wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and



each relay unit comprising an axially symmetric set of relay lenses, wherein a relay gap is disposed between each pair of adjacent relay units so that an associated relay intermediate image is formed therein.

<sup>65</sup>  
~~66~~

(Added)

The endoscope of claim <sup>61</sup>~~62~~ wherein the relay lens system comprises a plurality of axially separated relay units, the relay units being interchangeable and each relay unit comprising an axially symmetric set of relay lenses, wherein an optical element is disposed between each pair of adjacent relay units so that an intermediate image is formed in the optical element.

*Al Cont.*

<sup>66</sup>  
~~67~~

(Added)

The endoscope of claim <sup>65</sup>~~66~~ wherein the optical element has a refractive index greater than one.

<sup>67</sup>  
~~68~~

(Added)

An endoscope comprising:

a shaft having a distal portion adjacent a distal end and a proximal portion adjacent a proximal end;

an objective lens system disposed along the distal portion;

an ocular lens system disposed along the proximal portion, the ocular lens system comprising a lens; and

a relay lens system disposed along the shaft between the objective lens system and the ocular lens system,

wherein an intermediate image is formed in an optical element in the ocular lens system.

<sup>68</sup>  
~~69~~

(Added)

The endoscope of claim <sup>67</sup>~~68~~ wherein the relay lens system is separated from the objective lens system by an objective-relay gap and the relay lens system is separated from the ocular lens system by an ocular-relay gap.

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~~69~~  
~~70.~~

(Added)

is formed in the ocular-relay gap.

The endoscope of claim ~~69~~<sup>68</sup> wherein no intermediate image

A1  
Cont.

~~70~~  
~~71.~~

(Added)

is formed in the objective-relay gap.

The endoscope of claim ~~69~~<sup>68</sup> wherein no intermediate image

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